

SUBSTITUTE SPECIFICATION

NONRESONANT MICROMACHINED GYROSCOPES WITH STRUCTURAL MODE-DECOUPLING

Abstract of the Disclosure

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[00120] A four-degrees-of-freedom (DOF) nonresonant micromachined gyroscope utilizes a dynamical amplification both in the drive-direction oscillator and the sense-direction oscillator, which are structurally decoupled, to achieve large oscillation amplitudes without resonance. The overall dynamical system is comprised of three proof masses. The second and third masses form the sense-direction oscillator. The first mass and the combination of the second and third masses form the drive-direction oscillator. The frequency responses of the drive and sense-mode oscillators have two resonant peaks and a flat region between the peaks. The device is nominally operated in the flat regions of the response curves belonging to the drive and sense-mode oscillators, where the gain is less sensitive to frequency fluctuations. This is achieved by designing the drive and sense anti-resonance frequencies to match.